AMENDMENTS TO THE CLAIMS
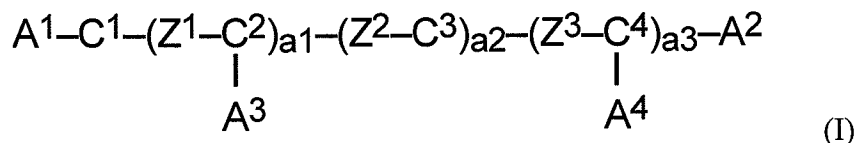
This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-65. (canceled).

66. (new): A mesogenic, cross-linkable mixture comprising:

i)   a cross-linkable liquid crystalline host comprising at least one cross-linkable liquid crystalline compound, and

ii)   at least one chiral or achiral rod shaped additive component, wherein the additive component is a compound of formula (I):
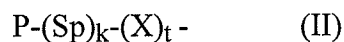
$$A^1-C^1-(Z^1-\underset{\underset{A^3}{|}}{C^2})_{a1}-(Z^2-C^3)_{a2}-(Z^3-\underset{\underset{A^4}{|}}{C^4})_{a3}-A^2 \qquad (I)$$

wherein:

C^1 to C^4 are selected from optionally substituted cyclohexyl or cyclohexylene, phenyl or phenylene, naphthyl or naphthylene or phenanthryl or phenanthrylene;

connected to each other at the opposite positions via the bridging groups Z^1 to Z^3;

wherein A^1 to A^3 each independently represent hydrogen or a group represented by formula (II), and

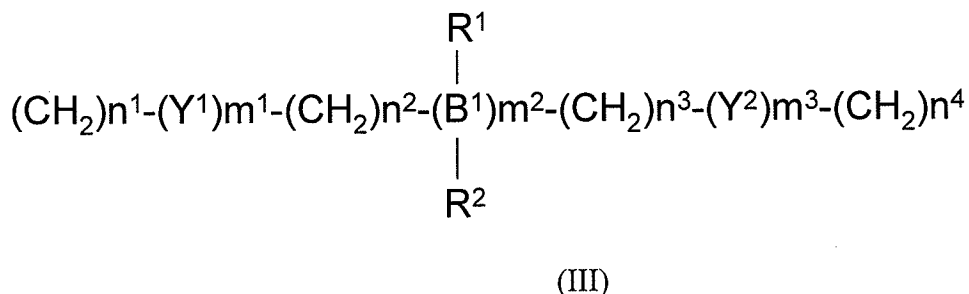wherein at least one of A^1 to A^3 has the meaning of formula (II),

$$P\text{-}(Sp)_k\text{-}(X)_t\text{-} \qquad (II)$$

wherein:

P   is hydrogen or a polymerizable group which is $CH_2=CW-$, $CH_2=CW-O-$,

$CH_2=CW-COO-$, wherein:

W   is H or CH_3,

Sp   has the meaning of formula (III)

$$(CH_2)n^1-(Y^1)m^1-(CH_2)n^2-(B^1)m^2-(CH_2)n^3-(Y^2)m^3-(CH_2)n^4 \overset{\displaystyle R^1}{\underset{\displaystyle R^2}{||}}$$

(III)

wherein:

Y^1 and Y^2 each independently represent -OCO- or -COO-,

B^1 represents C , which is chiral,

R^1 and R^2 each independently represent a C_1-C_{12} alkyl residue,

n^1, n^2, n^3 and n^4 are independently integers from 0 to 15,

such that $1 \leq n^1 + n^2 + n^3 + n^4 \leq 15$;

m^2 is 1,

m^1 and m^3 are independently integers from 0 to 1, and

wherein:

one or more $-CH_2-$ groups present in the hydrocarbon chain of (III) is unreplaced or

replaced, independently, by one or more groups selected from -O-, -CH=CH- or -C≡C-,

with the proviso that the carbon-carbon double bond of P is not directly connected to the
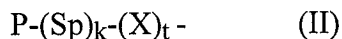
carbon atom of Y^1 or Y^2,

k   is 0 or 1, with the proviso that in at least one A^1 to A^3 k is 1,

3

X   is -O-, -CO-, -COO-, -OCO-, -CH=CH-, -C≡C-, or a single bond,

t   is 1;

or

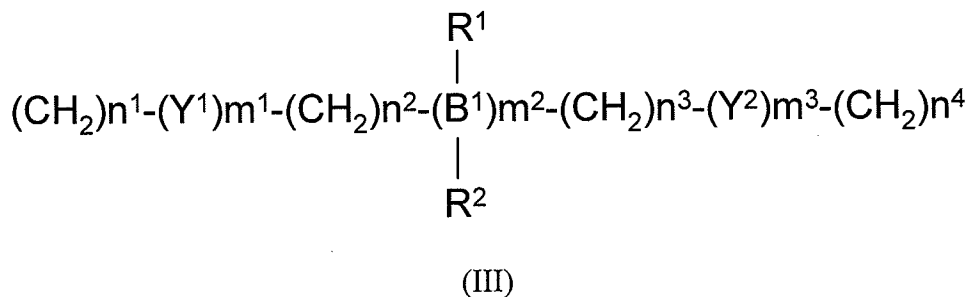wherein at least one of A^1 to A^3 has the meaning of formula (II),

$$P\text{-}(Sp)_k\text{-}(X)_t\text{-}\qquad (II)$$

wherein:

P   is hydrogen or a polymerizable group which is $CH_2=CW\text{-}$, $CH_2=CW\text{-}O\text{-}$,

$CH_2=CW\text{-}COO\text{-}$, wherein:

        W   is H or CH_3,

Sp   has the meaning of formula (III)

$$(CH_2)n^1\text{-}(Y^1)m^1\text{-}(CH_2)n^2\text{-}(B^1)m^2\text{-}(CH_2)n^3\text{-}(Y^2)m^3\text{-}(CH_2)n^4 \overset{\displaystyle R^1}{\underset{\displaystyle R^2}{|\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |}}$$

(III)

wherein:

Y^1 and Y^2 each independently represent -OCO- or -COO-,

B^1 represents C or CH,

R^1 and R^2 each independently represent hydrogen or a $C_1\text{-}C_{12}$ alkyl residue,

n^1, n^2, n^3 and n^4 are independently integers from 1 to 15,

        such that $1 \leq n^1 + n^2 + n^3 + n^4 \leq 15$;

m^1, m^2 and m^3 are 0 or 1, with the proviso that at least one of m^1 or m^3 is 1; and with the proviso that if m^1 is 1, than n^1 and at least one of n^2, m^2, n^3 or n^4 is 1; and if m^3 is 1 than n^4 is 1 and at least one of n^1, n^2, m^2 or n^3 is 1;

and wherein one or more -CH_2- groups present in the hydrocarbon chain of (III) is unreplaced or replaced, independently, by one or more groups selected from -O-, -CH=CH- or -C≡C-,
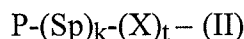
with the proviso that the carbon-carbon double bond of P is not directly connected to the carbon atom of Y^1 or Y^2,

k   is 0 or 1, with the proviso that at in least one of A^1 to A^3 k is 1,

X   is -O-, -CO-, -COO-, -OCO-, -CH=CH-, -C≡C-, or a single bond,

t   is 1;

A^4 is hydrogen, a polar group which is cyano, nitro, a halogen, or a group of formula (II)

$$P\text{-}(Sp)_k\text{-}(X)_t - \text{(II)}$$

in which:

P   is hydrogen or a polymerizable group which is $CH_2=CW$-, $CH_2=CW$-O-, $CH_2=CW$-COO- or

wherein:

W   is H, CH_3, F, Cl, Br or I,

R"   is a C_{1-6} alkyl group, methoxy, cyano, F, Cl, Br or I,

Sp   is a C_{1-22} branched or straight-chain alkylene group, in which one or more –CH_2– groups present in the hydrocarbon chain may be replaced, independently, by one or more

groups selected from -O-, -CH(OH)-, -SO$_2$-, -COO-, -OCO-, -OCO-O-, - CH=CH-,

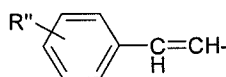-C≡C-, -(CF$_2$)$_r$ - ,

with the proviso that no two oxygen atoms are directly linked to each

other, and wherein r is an integer between 1 and 10,

    k   is 1,

    X   is -O-, -CO-, -COO-, -OCO-, -CH=CH-, -C≡C-, or a single bond,

    t   is 1,

with the proviso that at least one of A^1 to A^4 comprises a polymerizable group

which is CH$_2$=CW-, CH$_2$=CW-O-, CH$_2$=CW-COO- or

    wherein:
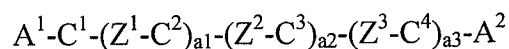
    W   is H, CH$_3$, F, Cl, Br or I,

    R"   is a C$_{1-6}$ alkyl group, methoxy, cyano, F, Cl, Br or I;

Z^1 to Z^3 are independently from each other -CH(OH)-, -CO-, -CH$_2$(CO)-, -SO-,

-CH$_2$(SO)-, -SO$_2$-, -CH$_2$(SO$_2$)-, -COO-, -OCO-, -COCF$_2$-, -CF$_2$CO-, -S-CO-, -CO-S-,

-SOO-, -OSO-, -SOS-, -CH$_2$-CH$_2$-, -OCH$_2$-, -CH$_2$O-, -CH=CH-, -C≡C-,

-CH=CH-COO-, -OCO-CH=CH-, -CH=N-, -C(CH$_3$)=N-, -N=N- or a single covalent

bond,

a1, a2 and a3   are independently from each other integers from 0 to 3, such that

    $1 \leq a1 + a2 + a3 \leq 3$,

with the proviso that the sequence:

$$A^1\text{-}C^1\text{-}(Z^1\text{-}C^2)_{a1}\text{-}(Z^2\text{-}C^3)_{a2}\text{-}(Z^3\text{-}C^4)_{a3}\text{-}A^2$$

describes the long molecular axis of the rod shaped additive components

and wherein the additive component changes from the liquid crystalline state to the

isotropic state at a temperature of 20 °C or lower.

67. (new): A mixture according to claim 66, wherein the additive component has a

transition temperature to the isotropic state of 0 °C or lower.

68. (new): A mixture according to claim 66 having a clearing temperature of 30 °C or

higher.

69. (new): A mixture according to claim 66 having a clearing temperature of 50 °C or
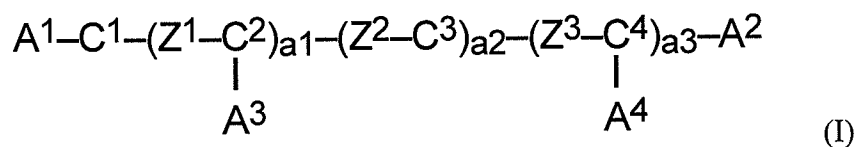
higher.

70. (new): A mixture according to any one of claims 66-69, wherein the liquid

crystalline host has a clearing temperature of 50 °C or higher.

52. (previously presented):

71. (new): A mixture according to claim 66 comprising further agents, which are cross-

linking agents, stabilizing agents, initiators, dyes, other chiral or achiral additives and

plasticizers.

72 (new): A mixture according to claim 66 in form of an elastomer, polymer gel,

polymer network or polymer film.

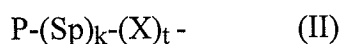73. (new): A chiral or achiral rod shaped compound, wherein said formula (I):

$$A^1\text{--}C^1\text{--}(Z^1\text{--}\underset{\underset{A^3}{|}}{C^2})_{a1}\text{--}(Z^2\text{--}C^3)_{a2}\text{--}(Z^3\text{--}\underset{\underset{A^4}{|}}{C^4})_{a3}\text{--}A^2 \tag{I}$$

wherein:

C^1 to C^4 are selected from optionally substituted cyclohexyl or cyclohexylene, phenyl or

phenylene, naphthyl or naphthylene or phenanthryl or phenanthrylene;

connected to each other at the opposite positions via the bridging groups Z^1 to Z^3;

wherein A^1 to A^3 each independently represent hydrogen or a group represented by

formula (II), and

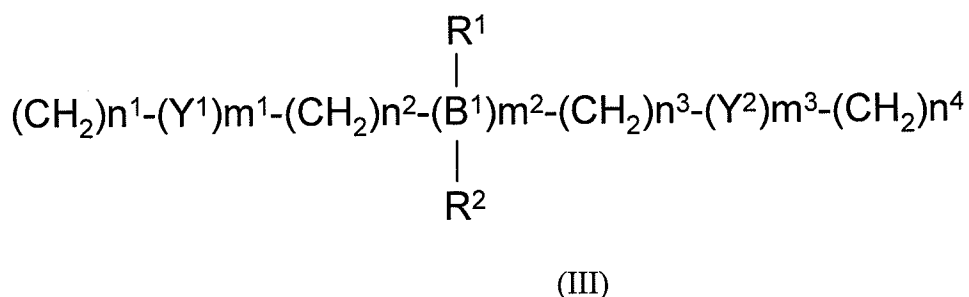wherein at least one of A^1 to A^3 has the meaning of formula (II),

$$P\text{-}(Sp)_k\text{-}(X)_t\text{-} \qquad \text{(II)}$$

wherein:

P   is hydrogen or a polymerizable group which is $CH_2=CW\text{-}$, $CH_2=CW\text{-}O\text{-}$,

$CH_2=CW\text{-}COO\text{-}$, wherein:

      W   is H or CH_3,

Sp   has the meaning of formula (III)

$$\overset{\displaystyle R^1}{\underset{\displaystyle R^2}{\overset{\displaystyle |}{\underset{\displaystyle |}{(CH_2)n^1\text{-}(Y^1)m^1\text{-}(CH_2)n^2\text{-}(B^1)m^2\text{-}(CH_2)n^3\text{-}(Y^2)m^3\text{-}(CH_2)n^4}}}}$$

(III)

wherein:

Y^1 and Y^2 each independently represent -OCO- or -COO-,

B^1 represents C , which is chiral,

R^1 and R^2 each independently represent a C_1-C_{12} alkyl residue,

n^1, n^2, n^3 and n^4 are independently integers from 0 to 15,

such that $1 \leq n^1 + n^2 + n^3 + n^4 \leq 15$;

m^2 is 1,

m^1 and m^3 are independently integers from 0 to 1, and

wherein:

one or more $-CH_2-$ groups present in the hydrocarbon chain of (III) is unreplaced or

replaced, independently, by one or more groups selected from $-O-$, $-CH=CH-$ or $-C \equiv C-$,

with the proviso that the carbon-carbon double bond of P is not directly connected to the

carbon atom of Y^1 or Y^2,

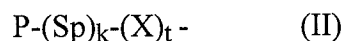k   is 0 or 1, with the proviso that in at least one A^1 to A^3 k is 1,

X   is $-O-$, $-CO-$, $-COO-$, $-OCO-$, $-CH=CH-$, $-C \equiv C-$, or a single bond,

t   is 1;

or

wherein at least one of A^1 to A^3 has the meaning of formula (II),

$$P-(Sp)_k-(X)_t - \qquad (II)$$
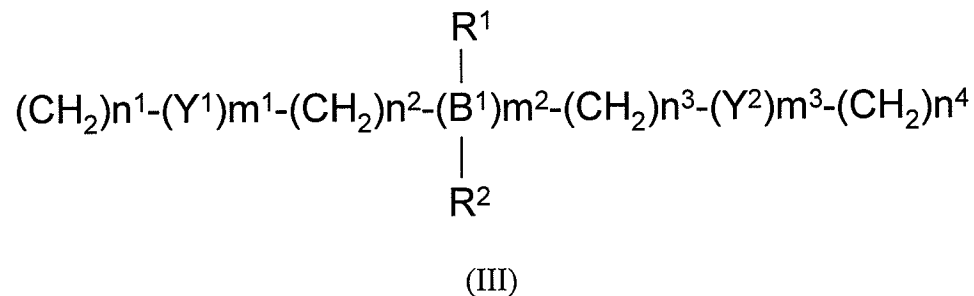
wherein:

P   is hydrogen or a polymerizable group which is $CH_2=CW-$, $CH_2=CW-O-$,

$CH_2=CW-COO-$, wherein:

W   is H or CH_3,

Sp   has the meaning of formula (III)

$$(CH_2)n^1-(Y^1)m^1-(CH_2)n^2-(B^1)m^2-(CH_2)n^3-(Y^2)m^3-(CH_2)n^4$$

with R^1 and R^2 substituents on $(B^1)m^2$.

(III)

wherein:

Y^1 and Y^2 each independently represent -OCO- or -COO-,

B^1 represents C or CH,

R^1 and R^2 each independently represent hydrogen or a C_1-C_{12} alkyl residue,

n^1, n^2, n^3 and n^4 are independently integers from 1 to 15,

such that $1 \leq n^1 + n^2 + n^3 + n^4 \leq 15$;

m^1, m^2 and m^3 are 0 or 1, with the proviso that at least one of m^1 or m^3 is 1; and with the

proviso that if m^1 is 1, than n^1 and at least one of n^2, m^2, n^3 or n^4 is 1; and if m^3 is 1 than

n^4 is 1 and at least one of n^1, n^2, m^2 or n^3 is 1;

and wherein one or more $-CH_2-$ groups present in the hydrocarbon chain of (III) is

unreplaced or replaced, independently, by one or more groups selected from -O-, -
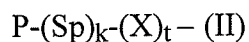
CH=CH- or -C≡C-,

with the proviso that the carbon-carbon double bond of P is not directly connected to the

carbon atom of Y^1 or Y^2,

k   is 0 or 1, with the proviso that at in least one of A^1 to A^3 k is 1,

X   is -O-, -CO-, -COO-, -OCO-, -CH=CH-, -C≡C-, or a single bond,

t   is 1;

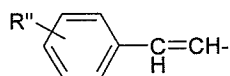A^4 is hydrogen, a polar group which is cyano, nitro, a halogen, or a group of formula (II)

$$P\text{-(Sp)}_k\text{-(X)}_t - \text{(II)}$$

in which:

P   is hydrogen or a polymerizable group which is CH_2=CW-, CH_2=CW-O-,

CH_2=CW-COO- or

$$\text{R''} \underset{}{\overset{}{\bigodot}} - \underset{H}{\overset{}{C}} = CH-$$

wherein:

W   is H, CH_3, F, Cl, Br or I,

R''   is a C_{1-6} alkyl group, methoxy, cyano, F, Cl, Br or I,

Sp   is a C_{1-22} branched or straight-chain alkylene group, in which one or more $-CH_2-$

groups present in the hydrocarbon chain may be replaced, independently, by one or more

groups selected from -O-, -CH(OH)-, $-SO_2-$, -COO-, -OCO-, -OCO-O-, - CH=CH-,

$-C{\equiv}C-$, $-(CF_2)_r -$,
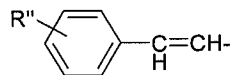
          with the proviso that no two oxygen atoms are directly linked to each

other, and wherein r is an integer between 1 and 10,

          k   is 1,

          X   is -O-, -CO-, -COO-, -OCO-, -CH=CH-, $-C{\equiv}C-$, or a single bond,

          t   is 1,

          with the proviso that at least one of A^1 to A^4 comprises a polymerizable group

which is $CH_2=CW-$, $CH_2=CW-O-$, $CH_2=CW-COO-$ or

$$\text{R''} \underset{}{\overset{}{\bigodot}} - \underset{H}{\overset{}{C}} = CH-$$

          wherein:

          W   is H, CH_3, F, Cl, Br or I,

          R''   is a C_{1-6} alkyl group, methoxy, cyano, F, Cl, Br or I;
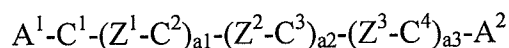
Z^1 to Z^3 are independently from each other -CH(OH)-, -CO-, $-CH_2(CO)-$, -SO-,

$-CH_2(SO)-$, $-SO_2-$, $-CH_2(SO_2)-$, -COO-, -OCO-, $-COCF_2-$, $-CF_2CO-$, -S-CO-, -CO-S-,

-SOO-, -OSO-, -SOS-, -CH$_2$-CH$_2$-, -OCH$_2$-, -CH$_2$O-, -CH=CH-, -C≡C-,

-CH=CH-COO-, -OCO-CH=CH-, -CH=N-, -C(CH$_3$)=N-, -N=N- or a single covalent

bond,

a1, a2 and a3 are independently from each other integers from 0 to 3, such that

$$1 \leq a1 + a2 + a3 \leq 3,$$

with the proviso that the sequence:

$$A^1\text{-}C^1\text{-}(Z^1\text{-}C^2)_{a1}\text{-}(Z^2\text{-}C^3)_{a2}\text{-}(Z^3\text{-}C^4)_{a3}\text{-}A^2$$

describes the long molecular axis of the rod shaped additive components.

74. (new): A method of using a chiral or achiral rod shaped compound, comprising

preparing a mesogenic polymer mixture as described in claim 66 and having a transition

temperature to the isotropic state of 20 °C or lower.

75. (new): A polymer network prepared from a mixture according to claim 66.

76. (new): A liquid crystalline polymer film prepared from a mixture according to claim

66.

77. (new): A method of using a polymer network or a liquid crystalline polymer film,

comprising preparing unstructured or structured optical and electro-optical components and

multilayer systems from (A) a polymer network prepared from a mixture according to claim 66

or (B) a liquid crystalline polymer film prepared from a mixture according to claim 66.

78. (new): A method of using a mesogenic, cross-linkable mixture, comprising preparing

an elastomer, polymer gel, polymer network or polymer film from a mesogenic, cross-linkable

mixture according to claim 66.

79. (new): A method of using a polymer network, comprising manufacturing waveguides, optical gratings, filters, retarders, polarizers, piezoelectric cells or thin film exhibiting non-linear optical properties from a polymer network according to claim 75.

80. (new): Optical or electro-optical components comprising a polymer network according to claim 75.

81. (new):   A method of using a liquid crystalline polymer film, comprising manufacturing waveguides, optical gratings, filters, retarders, polarizers, piezoelectric cells or thin film exhibiting non-linear optical properties from a liquid crystalline polymer film according to claim 76.

82. (new): Optical or electro-optical components comprising a liquid crystalline polymer film according to claim 76.